### Unit title

Field- and Laboratory-based Fitness Testing

<table>
<thead>
<tr>
<th>Guided learning hours</th>
<th>90</th>
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<tbody>
<tr>
<td>Number of lessons</td>
<td>90</td>
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<tr>
<td>Duration of lessons</td>
<td>1 hour (unless otherwise stated)</td>
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#### Links to other units

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 6: Coaching for Performance and Fitness
- Unit 8: Specialised Fitness Training
- Unit 9: Research Project in Sport and Exercise Science
- Unit 10: Physical Activity for Individual and Group-based Exercise

### Key to lesson types

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<thead>
<tr>
<th>AW</th>
<th>RS</th>
<th>GS</th>
<th>V</th>
<th>IS</th>
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<tr>
<td>Assignment writing</td>
<td>Revision session</td>
<td>Guest speaker</td>
<td>Visit</td>
<td>Independent study</td>
<td>Work experience</td>
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### Suggested activities

- **Tutor presentation:** inform learners about the learning aims and the number of assignments to be completed, making reference to the unit specification and the content to be covered.

### Learning aim A: Examine the preparation required prior to sport and exercise field- and laboratory-based testing
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<th>Suggested activities</th>
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</table>
| 1 (cont.) | **A1** Health and safety in a sport and exercise laboratory  
**Health and safety:**  
- testing human subjects  
- permissions  
- informed consent and disclaimers  
- preparation of subjects for testing | IS |  
- **Tutor presentation:** what are the key procedures that should be followed before testing? (Include preparing subjects, using adequate health and safety procedures such as consents, permissions etc.)  
- **Paired activity:** give learners A2 poster paper and ask them to draw a spider diagram identifying the key procedures, what they are and what their functions are.  
- **Independent or paired activity:** learners research procedures, and gain examples of participant informed consent forms and risk assessments.  
- **Plenary:** finish the lesson summarising the key points needed to prepare an individual for testing. | Access to internet and books for research  
Flipchart paper and pens |
| 2 & 3 | **A1** Health and safety in a sport and exercise laboratory  
**Risk management:**  
- laboratory safety  
- types of risk  
- identification  
- intervention | IS, AW, RS |  
- **Tutor presentation:** what is the difference between a risk and a hazard?  
- **Paired activity:** discussion on potential risks within the sports laboratory environment and how they may be overcome. Learners can prepare an A2 poster of risks that may be presented to the class for debate and open discussion.  
- **Independent activity:** prepare a formal risk assessment to be used and applied within the learning environment (e.g., in your sports hall, sports field, gym or in a dedicated sports laboratory, if available). Learners complete their risk assessment, categorise the risk and how it may be overcome.  
- **Class discussion:** learners feed back their ideas from the risk assessments, and analyse their relevance to field and laboratory testing. Learners identify the potential outcomes that may result due to lack of intervention in dealing with the risk highlighted. | Access to internet and books for research  
Risk assessment examples |
## Lesson 4

### A1 Health and safety in a sport and exercise laboratory

**Health screening:**
- essential uses
- types of screening
- aims
- applications in field and laboratory testing.

**Lesson type:** IS, AW

**Suggested activities**
- **Tutor presentation:** why is health screening important and what is its importance within field and laboratory testing?
- **Paired activity:** learners identify the uses of screening and produce a list of health assessment ideas, which they feel are relevant and important information, before exercise testing. Questions and ideas to be fed back within the group.
- **Class discussion:** learners feed back ideas that they feel are relevant questions for health screening before exercise testing. Encourage group debate to identify the important and not so important questions to ask.
- **Paired activity:** ask learners to design their own independent health screening form and then break into pairs so that they can complete each other’s questionnaire and receive feedback from their partner. Give learners a Physical Activity Readiness Questionnaire (PAR-Q) and in pairs they should complete and review their responses. The responses can be discussed with any potential barriers to completing physical-based activity shown in results.
- **Plenary:** finish the lesson as a recap of the health and safety requirements covered from week 1 to 4.

**Classroom resources**
Access to computer and online resources
Examples of health screening forms, including PAR-Q

## Lesson 5

### A2 Ethical considerations when conducting sport and exercise testing

**Ethical considerations:**
- exercise testing and client confidentiality
- data protection
- informed consent procedures

**Lesson type:** AW

**Suggested activities**
- **Tutor presentation:** focus on ethical considerations when performing a test procedure on any subject. What essential components ensure the subject remains anonymous?
- **Group activity:** give learners scenario-based worksheets that give examples of testing protocols and the results gathered. Learners identify problems that may be associated with ethical testing issues and recording of information. Examples may include the age of individuals within a given study, recording of data, use of names rather than subject, sharing of data, legality and conduct of the experimenter.
- **Paired activity:** learners discuss the need for informed consent form examples

**Classroom resources**
Scenario-based worksheets
Informed consent form examples
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| 6      | A2 Ethical considerations when conducting sport and exercise testing | AW, IS | **Tutor presentation:** understanding the welfare of the client during practical testing. ‘What are the important considerations that should be followed when completing practical testing?’  
**Group activity:** give learners a worksheet that highlights potential subject welfare considerations. Ask them to discuss what subject welfare considerations are, how they may affect the subject should they not be followed and the potential influences they may have on practical testing.  
**Independent activity:** give learners an ethics form with missing sections. Ask learners to complete the sections and review within class feedback. | Subject welfare worksheets  
Ethics form examples |
| 7 & 8  | A3 Validity and reliability of testing protocols when conducting sport and exercise assessments | IS, AW | **Tutor presentation:** introduce learners to the terminology and definition of validity and reliability.  
**Tutor-led discussion:** applications to be identified and related to practical testing.  
**Paired activity:** give learners an assessment protocol worksheet with a range of testing protocols. Ask them to identify potential problems with validity and reliability throughout. They should record outcomes and discuss within a group discussion.  
**Group activity:** learners feed back their identified concerns with validity and reliability, and debate the justifications for their responses.  
**Independent activity:** give learners a worksheet to record | Assessment protocol worksheets  
Worksheet to record definitions |
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<td></td>
<td>• data collection implications • testing variables</td>
<td>IS, AW</td>
<td>the definitions of validity and reliability; identify how it can be applied; explain the implications on data collection; and identify testing variables. • <strong>Plenary:</strong> learners to feed back a lesson summary of their independent worksheet to help summarise the lesson.</td>
<td>Health screening form examples Stadiometer Scales Calculators Measuring tapes Heart-rate monitors Peak flow meter (plus disposable tubes) Blood pressure monitors BIA measurement equipment Online data storage access</td>
</tr>
<tr>
<td>9 &amp; 10</td>
<td><strong>A1 Health and safety in a sport and exercise laboratory</strong> <strong>A2 Ethical considerations when conducting sport and exercise testing</strong> <strong>A3 Validity and reliability of testing protocols when conducting sport and exercise assessments</strong></td>
<td><strong>Practical health assessment and screening activity:</strong> Assessments: • height • weight • BMI • waist/hip ratio • pulse (bpm) • peak flow • blood pressure • BIA</td>
<td><strong>Tutor-led demonstration:</strong> introduce health screening exercises, with an outline of health and safety issues; include details such as hygiene concerns, cross-contamination, equipment care. Demonstrate the practical activities and provide an explanation of their uses. Explain the correct use of equipment and the health and safety procedures that need to be followed. Remind learners about ethical, validity and reliability considerations before testing. • <strong>Paired practical activity:</strong> learners conduct assessment protocols, take repeated measurements and record the data. Learners produce a data recording sheet and store it in a safe, secure electronic password-protected location. Data may also be recorded on a tutor’s secure electronic password-protected centre location. • <strong>Independent activity:</strong> learners complete their prepared health questionnaires and PAR-Q in readiness for testing.</td>
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<td>11–13</td>
<td>Assignment 1</td>
<td>IS, AW</td>
<td>• <strong>Independent learning activity:</strong> learners complete assessment work. Evidence may be in the form of a presentation, report or information booklet. Learners should spend session time and non-supervised time working on this assignment.</td>
<td>Computers Access to internet for online research Access to MS applications</td>
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### Learning aim B: Undertake anthropometry and somatotype testing procedures in sport

| 14 | B1 Anthropometric assessment methods applied within the sport and exercise laboratory **Principles behind anthropometry:** | IS | • **Tutor presentation:** introduce topic, with definitions of terms and methods, and discussion of their uses. Introduce learners to a range of anthropometric testing procedures, with methods briefly summarised.  
• **Independent activity:** learners use the methods identified by the tutor, and provide a list of potential ethical, validity and reliability concerns that may influence the outcome of testing.  
• **Paired work:** using the independent activity, the learners should discuss their points with a partner and debate their responses.  
• **Class discussion:** learners to feed back their points to the class, creating a spider diagram that will allow them to summarise the key points raised. | Anthropometric study protocols Anthropometric worksheets Access to online research for norms data |

| 15 | B1 Anthropometric assessment methods applied within the sport and exercise laboratory **analysis of body composition and** | AW | • **Tutor presentation:** introduce skinfold testing and recap on prior learning, outlining its importance within sport science.  
• **Tutor-led practical demonstration:** provide a detailed demonstration and explanation to show how learners should map out the body for consistent and accurate testing (pectoral, midaxillary, biceps, abdominal, suprailiac, mid- | Water-based marker pen Body mapping/diagram s of regional assessment sheet |
### Lesson | Topic | Suggested activities | Classroom resources |
|---|---|---|---|
| | familiarisation with the skinfold assessment measure  
- common techniques  
- norms data comparisons | thigh, gastrocnemius, subscapular, triceps, lower back). You should demonstrate the skinfold measuring technique accurately, reinforcing the correct use of equipment, client care and sensitivity, along with considerations for ethical, valid and reliable testing.  
- **Group discussion:** class discussion of skinfold measurements and their importance when analysing health (i.e., percentage body fat composition).  
- **Paired practical activity:** learners practise the technique of skinfold testing, under supervision (e.g., by tutor or other qualified person). | Skinfold calipers  
Measuring tapes  
Skinfold calculation facility |
| 16–18 | B1 Anthropometric assessment methods applied within the sport and exercise laboratory  
- learner-led practical analysis of skinfold assessment measures |  
- **Tutor presentation:** recap on previous lesson. Remind learners of the procedures and support provided during testing process.  
- **Paired practical activity:** learners repeat measures three times to practise their technique and to build confidence. Learners record each of the repetitive measures. | Water-based marker pen  
Body mapping/diagram s of regional assessment sheet  
Skinfold calipers  
Measuring tapes  
Skinfold calculation facility |
| 19 & 20 | B1 Anthropometric assessment methods applied within the sport and exercise laboratory  
**Introduction to anthropometric protocols:**  
- Durnin and |  
- **Tutor presentation:** introduce the assignment brief. Introduce specific assessment methods and calculations. Learners should become familiar with the testing protocols, their individual demands and similarities. Give learners appropriate formulas to allow for the manual calculation of an individual’s body density and percentage of body fat derived from the skinfold and girth circumference measures. | Water-based marker pen  
Body mapping/diagram s of regional assessment sheet  
Skinfold calipers  
Measuring tapes |
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<tr>
<td>21–24</td>
<td><strong>B1</strong> Anthropometric assessment methods applied within the sport and exercise laboratory &lt;br&gt;<strong>Introduction to somatotype:</strong> &lt;br&gt;• definitions &lt;br&gt;• types &lt;br&gt;• endomorph &lt;br&gt;• ectomorph</td>
<td>RS, AW</td>
<td>• <strong>Independent activity:</strong> provide supportive guidance so that learners are confident to use their individual results from the practice in previous lessons to manually calculate their results. Peer work may also be supportive during these calculations. &lt;br&gt;• <strong>Tutor presentation:</strong> recap on anthropometric measures. &lt;br&gt;• <strong>Paired practical activity:</strong> learners work in pairs to collect skinfold measurements and to perform calculations for body density and percentage of body fat, from the skinfold and girth circumference measures. Learners repeat their measurements three times, and keep a full record of their personal data in an appropriate confidential location.</td>
<td>Protocol calculation handouts &lt;br&gt;Access to online data storage</td>
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<td>25</td>
<td><strong>B2</strong> Somatotype profiling applied within the sport and exercise laboratory &lt;br&gt;<strong>Introduction to somatotype:</strong> &lt;br&gt;• definitions &lt;br&gt;• types &lt;br&gt;• endomorph &lt;br&gt;• ectomorph</td>
<td>AW</td>
<td>• <strong>Tutor presentation:</strong> introduce somatotype. 'What is somatotype and what are its applications to sport and exercise performance?' &lt;br&gt;• <strong>Paired activity:</strong> give learners a range of body shapes for them to identify and categorise. Learners should apply the terms to sport and exercise performance (profile) and justify the reasons for their decision. Which body shape is best suited to sporting examples and why?</td>
<td>Somatotype structures handout &lt;br&gt;Somatotype definitions and labelling worksheet</td>
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| 26     | B2 Somatotype profiling applied within the sport and exercise laboratory | AW          | • **Tutor presentation:** introduce applications of somatotypes in sports performance. Introduce learners to the influences somatotyping may have on sports performance. Explore comparative norms and encourage open discussion.  
• **Group activity:** give learners a range of sporting performers who have diverse somatotype proportions. Ask the group to make a critical analysis of the shapes and sizes, and to explain in detail why size is important to success for these sports people.  
• **Class discussion:** groups feed back the points arising from their discussions in a whole class discussion, and provide a justification for their responses. | Somatotype picture worksheet activity       |
| 27 & 28| B2 Somatotype profiling applied within the sport and exercise laboratory | IS, AW      | • **Tutor presentation:** introduce somatotyping, and its applications in sport and exercise science. Introduce learners to appropriate terminology. Give learners a Heath–Carter assessment rating form, and a somatochart for future calculation.  
• **Paired practical activity:** learners work in pairs to gather the measurements required for the Heath–Carter assessment rating.  
• **Independent activity:** learners use the data collected in the paired activity to calculate their somatotype independently, using the Heath–Carter assessment rating form, and then plot the result on a somatochart. | Heath–Carter assessment rating form  
Somatochart Protocol calculation handouts  
Water-based pens  
Body mapping/diagram s of regional assessment sheet  
Skinfold calipers  
Measuring tapes  
Access to online |
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</table>
| 29–31  | Assignment 2  
  • tasks for learning aim B  
  • centre-devised assignment or Pearson authorised assignment | IS, AW | **Independent activity**: complete assessment work. Evidence may be in the form of a presentation, report or information booklet. Learners should spend session time and non-supervised time working on this assignment. | Computers  
 Access to internet for online research  
 Access to MS applications |

**Learning aim C: Explore the use of field- and laboratory-based protocols in sport and exercise sciences**

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| 32     | C1 Applied laboratory and experimental testing  
 **Assignment 3**  
 **Experimental testing:**  
 • pre-testing preparation  
 • measurement and recording techniques  
 • ethical/valid/reliable testing  
 • data logbook preparation | IS, AW, RS | **Tutor presentation**: introduce assignment 3 and outline its requirements. Recap experimental testing preparation. Identify experimental testing protocols for varying fitness components.  
 **Paired activity**: give learners a worksheet of tests and ask them to explain the correct protocol. Give learners a worksheet of scenario-based sporting activities and ask them to identify the most appropriate test to analyse the major component of the event.  
 **Independent activity**: learners prepare a data collection logbook for the practical testing protocols that need to be followed. | Access computers and online resources  
 Protocol worksheets for testing procedures |
| 33 & 34| C1 Applied laboratory and experimental testing  
 **Introduction to testing protocols:**  
 • aerobic assessment  
 • anaerobic assessment | AW | **Tutor presentation**: introduce common assessment procedures used within field- and laboratory-based testing. ‘What are the common tests used and which fitness component could they measure?’  
 **Group activity**: give learners a number of named fitness tests and ask them to identify their use and what component of fitness they measure. Learners should justify their answers, | Fitness test worksheets |
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<tr>
<td></td>
<td>• power assessment</td>
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<td>with links made to prior learning of ‘validity’.</td>
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<td>• strength assessment</td>
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<td>• <strong>Class discussion</strong>: learners feed back on their group activity, justifying their decisions within a whole class debate.</td>
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<td>• flexibility assessment</td>
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<td>• <strong>Independent activity</strong>: learners record the outcomes of session feedback.</td>
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<td>35–37</td>
<td><strong>C1</strong> Applied laboratory and experimental testing</td>
<td>IS, AW</td>
<td><strong>Tutor-led practical demonstration</strong>: introduce the Astrand–Rhyming cycle ergometer test and its application within sport and exercise science. Give learners protocol instructions, and the calculations required for VO₂ evaluation. Give learners comparative norms data to allow them to reflect on their practical assessment results.</td>
<td>Tutor-led presentation and protocol outline Cycle ergometer, and appropriate resistance Heart-rate monitor Stopwatch Formula calculations Online data recording facility</td>
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<td><strong>C2</strong> Experimental data collection methods used within the sport and exercise laboratory</td>
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<td>• <strong>Paired practical activity</strong>: learners work in pairs to gather the cycle data required by the protocol.</td>
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<td><strong>Practical activity</strong>:</td>
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<td>• <strong>Independent activity</strong>: learners use the data collected in the paired activity to calculate their VO₂ independently. All data should be recorded in their logbook.</td>
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<td>• Astrand–Rhyming cycle test</td>
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<td>• <strong>Plenary</strong>: finish with summary discussion on the results gained and what the outcomes show.</td>
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<td>• pre-test checks</td>
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<td>• protocol</td>
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<td>• equipment safety</td>
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<tr>
<td>38 &amp; 39</td>
<td><strong>C1</strong> Applied laboratory and experimental testing</td>
<td>IS, AW</td>
<td><strong>Tutor-led practical demonstration</strong>: introduce the RAST and its application in sport and exercise science. Give learners protocol instructions and the calculations for measurements of peak power, average power and minimum power, along with a fatigue index. Give learners comparative norms data to allow them to reflect on their practical assessment results.</td>
<td>Sports field/running track/sports hall Protocol handout Cones Stopwatch</td>
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<td><strong>C2</strong> Experimental data collection methods used within the sport and exercise laboratory</td>
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<td>• <strong>Group practical activity</strong>: learners work in small groups to gather the sprint test time data and to share this with the participants.</td>
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<td><strong>Practical activity</strong>:</td>
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<td>• <strong>Independent activity</strong>: learners use the data collected in the</td>
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| 40 & 41 | **C1** Applied laboratory and experimental testing  
**C2** Experimental data collection methods used within the sport and exercise laboratory | IS, AW |  
**Tutor-led practical demonstration presentation:** introduce the 30-second Wingate cycle ergometer test, and its application in sport and exercise science. Give learners protocol instructions for the calculations of anaerobic power and capacity.  
Give learners comparative norms data to allow them to reflect on their practical assessment results.  
**Group activity:** learners work in small groups to gather the cycle data required by the protocol.  
**Independent activity:** learners use the data collected in the paired activity to calculate their anaerobic power and capacity independently. All data should be recorded in their logbooks.  
**Plenary:** finish with a summary discussion on the results gained and what the outcomes show. | Tutor-led presentation and protocol outline  
Cycle ergometer, and appropriate resistance  
Wingate cycle recording software  
Formula calculations  
Online data recording facility |
| 42 & 43 | **C1** Applied laboratory and experimental testing  
**C2** Experimental data collection methods used within the sport and exercise laboratory | IS, AW |  
**Tutor-led practical demonstration presentation:** introduce vertical jump, back dynamometer and grip dynamometer tests, and their applications in sport and exercise science. Give learners protocol instructions for the calculations of peak power (vertical jump).  
Give learners comparative norms data to allow them to reflect on their practical assessment results.  
**Paired practical activity:** learners work in pairs to gather their individual data, as required by the protocol.  
**Independent activity:** learners use the data collected in the paired activity to calculate their anaerobic power (vertical jump). | Tutor-led presentation and protocol outline  
Vertical jump equipment  
Back dynamometer equipment  
Grip dynamometer |
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| 44–46  | C1 Applied laboratory and experimental testing  
       | C2 Experimental data collection methods used within the sport and exercise laboratory | IS, AW, V | **Tutor-led practical presentation:** introduce the one repetition maximum (1RM), and its application in sport and exercise science. Give learners protocol instructions, and explain safety when lifting.  
**Tutor-led practical demonstration:** introduce the one-minute press-up test and one-minute sit-up test, and their applications in sport and exercise science. Give learners protocol instructions.  
**Paired practical activity:** learners work in pairs to gather the press-up/sit-up data, as required by the protocol.  
**Independent activity:** learners use the data collected in the paired activity to record in their logbooks. | Tutor-led presentation and protocol outline (facility determined)  
Gym and resistance access  
Online data recording facility |
| 47     | C1 Applied laboratory and experimental testing  
       | C2 Experimental data collection methods used within the sport and exercise laboratory | IS, AW | **Tutor-led practical presentation:** introduce the one-minute press-up test and one-minute sit-up test, and their applications in sport and exercise science. Give learners protocol instructions.  
**Tutor-led practical demonstration:** introduce the one repetition maximum (1RM), and its application in sport and exercise science. Give learners protocol instructions, and explain safety when lifting.  
**Paired practical activity:** learners work in pairs to gather the press-up/sit-up data, as required by the protocol.  
**Independent activity:** learners use the data collected in the paired activity to record in their logbooks. | Tutor-led presentation and protocol outline  
Stopwatch  
Gym mat  
Online data recording facility |
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<td>test</td>
<td>IS, AW</td>
<td>• <strong>Plenary</strong>: finish with a summary discussion on the results gained and what the outcomes show.</td>
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<td>• pre-test checks</td>
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<td>Tutor-led presentation and protocol outline</td>
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<td>• protocol</td>
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<td>Sit-and-reach box</td>
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<td>• safety procedures</td>
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<td>Goniometer</td>
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<td>48</td>
<td><strong>C1</strong> Applied laboratory and experimental testing</td>
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<td><strong>C2</strong> Experimental data collection methods used within the sport and exercise laboratory</td>
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<td>Online data recording facility</td>
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<td><strong>Practical activity</strong>:</td>
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<td>• static flexibility testing</td>
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<td>IS, AW</td>
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<td>Tutor-led practical demonstration: introduce the multi-stage fitness test, and its application in sport and exercise science. Give learners protocol instructions and the calculations required for VO$_2$ max evaluation. Give learners comparative norms data to allow them to reflect on their practical assessment results.</td>
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<td>IS, AW</td>
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<td><strong>Independent activity</strong>: learners gather data and independently calculate their VO$_2$ max. All data should be recorded in their logbooks.</td>
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<td>IS, AW</td>
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<td><strong>Plenary</strong>: finish with a summary discussion on the results gained and what the outcomes show.</td>
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<tr>
<td>49 &amp; 50</td>
<td><strong>C1</strong> Applied laboratory and experimental testing</td>
<td></td>
<td></td>
<td>Tutor-led presentation and protocol outline</td>
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<td></td>
<td><strong>C2</strong> Experimental data collection methods used within the sport and exercise laboratory</td>
<td></td>
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<td>Sports hall</td>
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<td><strong>Practical activity</strong>:</td>
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<td>Sound projection device</td>
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<td>• multi-stage fitness test</td>
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<td>Multi-stage fitness audio</td>
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<td>• pre-test checks</td>
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<td>Cones</td>
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<td>IS, AW</td>
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<td>Online data</td>
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<td>Lesson</td>
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<td>Classroom resources</td>
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| 51     | C1    | IS, AW, V   | **Tutor-led presentation**: introduce the 12-minute Cooper run test and its application in sport and exercise science. Give learners protocol instructions and the calculations required for VO\textsubscript{2} max evaluation.  
**Independent activity**: learners gather data to calculate their VO\textsubscript{2} max independently. All data should be recorded in their logbooks.  
**Plenary**: finish with a summary discussion on the results gained and what the outcomes show. | Tutor-led presentation and protocol outline  
Running track/sports field (cones)  
Stopwatch  
Data recording facility |
| 52     | C1    | IS, AW, V   | **Tutor presentation**: introduce the flying 30-m sprint test, and its application in sport and exercise science. Give learners protocol instructions.  
Give learners comparative norms data to allow them to reflect on their practical assessment results.  
**Pair practical activity**: learners to work in pairs and collect the sprint test time data.  
**Independent activity**: learners use the data collected to record in their logbooks.  
**Plenary**: finish with a summary discussion on the results gained and what the outcomes show. | Tutor-led presentation and protocol outline  
Sports hall/running track/sports field  
Cones  
Stopwatch  
Data recording facility |
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| 53     | C1    | IS, AW      | **Tutor-led practical demonstration:** introduce the Illinois agility and T-drill tests, and their applications in sport and exercise science. Give learners protocol instructions. Give learners comparative norms data to allow them to reflect on their practical assessment results.  
**Paired practical activity:** learners work in pairs to collect the test timed data.  
**Independent activity:** learners use the data collected to record in their logbooks.  
**Plenary:** finish with a summary discussion on the results gained and what the outcomes show. | Tutor-led presentation and protocol outline  
Cones  
Stopwatch  
Data recording facility (password protected) |
|        | C2    | IS, AW      | **Data collection:**  
- preparation of tables  
- formatting data  
- appropriate table structure  
- use of correct labels and units  
- subject confidentiality  
- introduction to SPSS/Excel | |
| 54-56  | C3    | IS, AW      | **Tutor presentation:** introduce data handling; preparation of all test data, using appropriate tables with the correct use of units, and presentation of data. How should data be presented to allow for accurate interpretation?  
Develop an understanding among learners of data handling, using an appropriate layout and correct labelling of units. You may choose to demonstrate examples of table construction and different templates of data presentation to assist with learning.  
**Group activity:** learners share class data with individuals labelled as ‘subject’ (confidentiality), for their own personal calculations.  
**Independent activity:** learners handle data, presenting it in tables, using appropriate units and layout. | Computer facilities with access to SPSS/Excel |
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| 57–59  | C3 Data handling and evaluation of outcomes when conducting laboratory experimentation | IS, AW | **Tutor presentation:** data handling; preparing test data, the appropriate use of graphs, with the correct layout, size, use of units and clarity of presentation. What are the outcomes of the data analysis? Develop an understanding among learners about graphs, their structure and appropriate use for data interpretation. You may choose to demonstrate the construction of graph examples, discuss the most appropriate templates for interpretation and lead a debate about their use in a research study.  
**Independent activity:** learners handle data to present appropriate graphs using SPSS/Excel. They must ensure that the correct layout is followed, their size is appropriate, they include units and are clearly presented. | Computer facilities with access to SPSS/Excel |
| 60 & 61 | C3 Data handling and evaluation of outcomes when conducting laboratory experimentation | IS, AW | **Tutor presentation:** data handling; calculating mode/median/range. What are the outcomes to the group’s performance? Lead a discussion about the use of these calculations and what they may show from a data sample? Learners perform calculations of the data sample calculated, and the outcomes debated in class discussion.  
**Independent activity:** learners should individually perform calculations of mode/median/range on the data collected using SPSS/Excel. | Computer facilities with access to SPSS/Excel |
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| 62–65  | **C3** Data handling and evaluation of outcomes when conducting laboratory experimentation | IS, AW | **Tutor presentation:** data handling; calculate appropriate standard deviation tests on the data collected. What is standard deviation and what can it show from a data sample gathered during field- and laboratory-based fitness testing? Explore the use of standard deviation and demonstrate its calculation.  
**Independent activity:** learners may perform calculations on the data collected from tests performed in previous lessons. What are the outcomes of the group’s performance based on its calculation?  
**Independent activity:** learners perform calculations individually on the data collected using SPSS/Excel | Computer facilities with access to SPSS/Excel |
| 66–70  | **C3** Data handling and evaluation of outcomes when conducting laboratory experimentation | IS, AW | **Tutor presentation:** data handling; calculate appropriate t-tests on the data collected. What are the outcomes to the group’s performance?  
What is a t-test and what can it show from a data sample gathered during field- and laboratory-based fitness testing? Explore the use of a t-test and demonstrate its calculation.  
**Independent activity:** learners may perform calculations on the data collected from tests performed in previous lessons. What are the outcomes of the group’s performance based on its calculation?  
**Independent activity:** learners perform calculations individually on the data collected using SPSS/Excel. | Computer facilities with access to SPSS/Excel |
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| 71–74  | C3 Data handling and evaluation of outcomes when conducting laboratory experimentation | IS, AW | **Tutor presentation:** data handling; calculate appropriate Pearson correlation coefficient on the data collected. What are the outcomes of the group’s performance?  
What is Pearson correlation coefficient and what can it show the sport scientist from a data sample gathered during field- and laboratory-based fitness testing? Explore the use of Pearson correlation coefficient and demonstrate its calculation. Discuss and analyse, as a whole class group, the resulting graphs. What are the outcomes to the group’s performance based on its calculation?  
**Independent activity:** learners perform relevant calculations individually on the data collected using SPSS/Excel. | Computer facilities with access to SPSS/Excel |
| 75–78  | Assignment 3 | IS, AW | **Independent activity:** development work for assignment 3, learning aim C. This may form part of the full assignment brief for learning aim C and learning aim D.  
Evidence may be in the form of a written report or presentation.  
Learners should spend session time and non-supervised time working on this assignment. | Computers  
Access to internet for online research  
Access to Microsoft applications |

**Learning aim D: Explore profiling of a sports performer following practical research design using field- and laboratory-based testing**

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</table>
| 79 & 80| D1 Scientific application of experimental protocols in sport and exercise science | IS | **Tutor presentation:** introduce the role of an investigative sports scientist. Provide a detailed explanation of how to develop a research case study, which should include a title, aims, introduction, method, results, analysis, discussion, | Access to computers  
Access to online research |
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<tbody>
<tr>
<td><strong>Assignment 3:</strong>&lt;br&gt;• tasks for learning aims C and D&lt;br&gt;• use centre-devised assignment or authorised assignment from Pearson</td>
<td><strong>Lesson type</strong></td>
<td><strong>Suggested activities</strong></td>
<td><strong>Classroom resources</strong></td>
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<td>IS, AW</td>
<td>conclusion, research evidence (references/bibliography). Introduce learners to assignment 3, constructing an investigation into physiological profiling.&lt;br&gt;• <strong>Independent activity:</strong> learners to prepare a case study (based on the assignment) with links to sports performance. The study may examine fitness testing performance and sporting success.</td>
<td>resources Assignment brief</td>
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<td><strong>81–84</strong>&lt;br&gt;&lt;br&gt;<strong>D1 Scientific application of experimental protocols in sport and exercise science</strong>&lt;br&gt;&lt;br&gt;<strong>Assignment 3</strong></td>
<td>IS, AW</td>
<td><strong>Tutor presentation:</strong> recap on the case study design and support provided for learners.&lt;br&gt;• <strong>Independent activity:</strong> learners continue with their case study, focusing on the title, aims, introduction, method, results and analysis.</td>
<td>Access to computers Access to online research resources Assignment brief</td>
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<td><strong>85</strong>&lt;br&gt;&lt;br&gt;<strong>D2 Performance profiling through research design</strong>&lt;br&gt;&lt;br&gt;<strong>Physiological and anatomical characteristics of performer:</strong>&lt;br&gt;• height&lt;br&gt;• weight&lt;br&gt;• fitness components&lt;br&gt;• norms comparisons&lt;br&gt;• performance outcomes</td>
<td>IS, AW</td>
<td><strong>Tutor presentation:</strong> introduce performance profiling of the individual. How does performance profiling potentially identify success?&lt;br&gt;• <strong>Group activity:</strong> using a worksheet, identify the key physical traits for a selected number of sports performers.&lt;br&gt;• <strong>Paired activity:</strong> using A2 paper, justify why the selected physical fitness traits are important to the exercise performance event.</td>
<td>Physiological and anatomical traits worksheet Flipchart paper</td>
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<td><strong>86 &amp; 87</strong>&lt;br&gt;&lt;br&gt;<strong>D2 Performance profiling through research design</strong></td>
<td>IS, AW</td>
<td><strong>Tutor presentation:</strong> introduce performance norms data. Identify strengths and weaknesses of a sports performance.</td>
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|        | Physiological and anatomical characteristics of performer:  
• data evaluation  
• norms comparisons  
• performance outcomes  
• recommended analysis | | Analyse potential physical fitness, areas of weakness and strengths.  
• **Independent activity:** learners reflect on their individual data and highlight performance differences across the class.  
• **Paired activity:** discuss, noting the areas of strengths/weaknesses, and justify the reasons for these differences. | Access to online research resources |
| 88–90  | D2 Performance profiling through research design  
Assignment 3 | IS, AW |  
• **Tutor presentation:** recap on the case study design and support provided for learners.  
• **Independent activity:** learners continue work on their case study, focusing on the title, aims, introduction, method, results and analysis. | Access to computers  
Access to online research resources  
Assignment brief |